

**Notice of Allowability**

Application No.

10/625,811

Examiner

Tuan N. Nguyen

Applicant(s)

CHUA, CHRISTOPHER L.

Art Unit

2828

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 01/30/2007.
2. ☒ The allowed claim(s) is/are <sup>15</sup> 1-18, 17-20, 22-33.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 3/28/2007.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

***Response to Amendment***

1. In responding to applicant's amendment filed 01/30/2007, claims 1, 3, 5, 6, 12, 15, 17, 21, 22, 26 have been amended.

**EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below, to the amended claims 12, 16, 21 should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview on March 28, 2007 with Mr. Kent Chen (Attorney for Applicant, Reg. No. 39,630).

**Claim 12:**

(Currently Amended) An array of vertical cavity surface emitting lasers (VCSELs) comprising:

a first VCSEL including a first laser aperture, the first laser partially surrounded by a first oxide wall and at least an opening in the first oxide wall;

a second VCSEL positioned adjacent to the first VCSEL, the second VCSEL including a second laser aperture partially surrounded by a second oxide wall and an opening in the second oxide wall, the opening in the first oxide wall and the opening in the second oxide wall aligned to facilitate evanescent fields from the first VCSEL to interact with an active region of the second VCSEL and thereby cause mode coupling between the first VCSEL and the second VCSEL; and, a p-side contact that contacts both the first VCSEL and the second VCSEL, the p-

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side contact to simultaneously provide current to the first VCSEL and the second VCSEL, wherein a third VCSEL positioned adjacent to the first VCSEL, the third VCSEL including a third laser aperture partially surrounded by a third oxide wall and an opening in the third oxide wall, a second opening in the first oxide wall and the opening in the third oxide wall aligned to allow evanescent fields from the first VCSEL to reach an active region of the third VCSEL.

**Claim 16 is CANCELED.**

**Claim 21 is CANCELED.**

### **REASON FOR ALLOWANCE**

#### ***Allowable Subject Matter***

3. The following is an examiner's statement of reasons for allowance - Applicant's response filed on 01/30/2007 has been considered, with respect to claims 1, 12, 15, 17, 21, 22, and 26 the references of the record fail to teach or suggest an array of vertical cavity surface emitting laser and method of forming comprising:

#### **Claims 1, 22:**

*A first VCSEL with first aperture partially bounded by an oxidized wall including an opening in the first oxide wall; a second VCSEL adjacent to the first VCSEL including a second aperture partially bounded by an oxidized wall including an opening in the second oxide wall, where the first and second VCSEL closely packed such that where the top contact simultaneously provide current to the first and second VCSEL, the openings in the first oxide wall and the second oxide wall are sufficiently large that evanescent fields output by the first VCSEL causes mode coupling between the first and second VCSEL.*

**Claim 12, 26:**

*A first VCSEL with first aperture partially surrounded by an oxidized wall with an opening in the first oxide wall; a second VCSEL adjacent to the first VCSEL including a second aperture partially bounded by an oxidized wall including an opening in the second oxide wall, a p-side contact provide simultaneous current to both first and second VCSEL, where the openings of the first and second oxide wall aligned to facilitate evanescent fields from the first VCSEL to interact with an active region of the second VCSEL and cause mode coupling between the two VCSEL.*

**Claim 15:**

*Wherein a high gain coupling region coupled at the opening in the first and second oxide wall and the contact to provide current to high gain coupling region.*

**Claim 17:**

Wherein a third VCSEL with partial oxide wall and an opening adjacent to the first VCSEL, where the opening in the first oxide and third oxide wall aligned to allow evanescent fields from the first VCSEL to reach an active region of the third VCSEL, where a plurality of high gain coupling regions including a first high gain region coupling the opening of first oxide wall to second oxide wall and the second opening to third oxide wall.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



### Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen

  
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